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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/592,032	07/09/2007	Pierpaolo Boffi	10880.0406	9399
22852	7590	10/26/2010		
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413			EXAMINER SINGH, DALZID E	
			ART UNIT 2613	PAPER NUMBER
			MAIL DATE 10/26/2010	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/592,032

Applicant(s)

BOFFI ET AL.

Examiner

Dalzid Singh

Art Unit

2613

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25-30 and 32 is/are allowed.
- 6) ☒ Claim(s) 16-20, 23, 24 and 31 is/are rejected.
- 7) ☒ Claim(s) 21 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB06)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 16-20, 23, 24 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGhan et al (US Pub. No. 2005/0007642).

Regarding claims 16 and 24, McGhan et al discloses method for modulating optical radiation, as shown in Fig. 3, comprising the steps of:

phase-modulating the optical radiation with a modulation signal, by using a modulator (4), so as to obtain a multi-level phase shift key optical signal comprising a stream of optical pulses, wherein each of said optical pulses has a respective optical phase value related to said modulation signal (stream of pulses is shown on Fig. 5a, see paragraph [0026]).

Figure 3 of McGhan et al does not show a phase shifter to phase shift each of the optical signal. However, on Fig. 2b of a conventional MZ modulation, McGhan et al teaches cascaded phase shifter to apply a respective phase shift to the single or differential signal pair of the modulated optical signals which controlled by driver (20) (see paragraph [0010-0012]). Since McGhan et al teaches the use of a cascaded phase shifter which is similar to the cascaded phase shifter of applicant's invention as shown

on Fig. 2, therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to apply to each of said optical pulses a respective phase-shift, each respective phase shift having a substantially equal magnitude, each respective phase shift having a sign determined as a function of the respective optical phase value in order to synchronize and provide E-field modulation of the carrier signal throughout the complex polar plane.

Regarding claim 23, wherein said multilevel phase shift key optical signal is a differential multilevel phase shift key optical signal (McGhan et al discloses MZ modulator; it is inherent that MZ modulator comprises interferometer which provides differential signal).

Regarding claims 17-20, McGhan et al discloses phase adjustment of the signal and differs from the claimed invention in that McGhan et al do not specifically discloses wherein the magnitude of said phase-shift is substantially constant in each of said optical pulses or wherein the magnitude of said phase-shift is equal to or less than about $n/10$ or wherein said modulator has an extinction ratio and the magnitude of said phase-shift is determined as a function of said extinction ratio or wherein the absolute value of said phase-shift is equal to about $\arctg(1/ER)$, wherein ER_{\min} is the extinction ratio. However, McGhan et al teaches that the phase is adjustable. Based on this teaching, it would have been obvious to an artisan at the time of the invention to adjust the phase to be within predetermined value. Furthermore, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the

optimum or workable ranges by routine experimentation. *In re Swain et al.*, 33 CCPA (Patents) 1250, 156 F.2d 239, 70 USPQ 412; *Minnesota Mining and Mfg. Co. v. Coe*, 69 App D.C. 217, 99 F.2d 986, 38 USPQ 213; *Allen et al. v. Coe*, 77 App D.C. 324, 135 F.2d 11, 57 USPQ 136. In addition, discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Antonie*, 559 F.2d 239, 618, 195 USPQ 6 (CCPA 1977); *In re Aller*, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955). See also *In re Aller*, 105 USPQ 233 (CCPA 1955) and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to an artisan of ordinary skill to adjust the phase to an optimum or workable value or range by routine experimentation.

Regarding claim 31, as discussed above McGhan et al teaches that the phase is adjustable, therefore it would have been obvious to adjust the phase to output a desired function in order to reduce noise.

Allowable Subject Matter

3. Claims 25-30 and 32 allowed.
4. Claims 21 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalzid Singh whose telephone number is (571) 272-3029. The examiner can normally be reached on Mon-Fri 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dalzid Singh/
Primary Examiner
Art Unit 2613